Center Independent Research & Development: GSFC IRAD

Laser Source for Atomic Gravity Wave Detector Project

Completed Technology Project (2012 - 2013)

Project Introduction

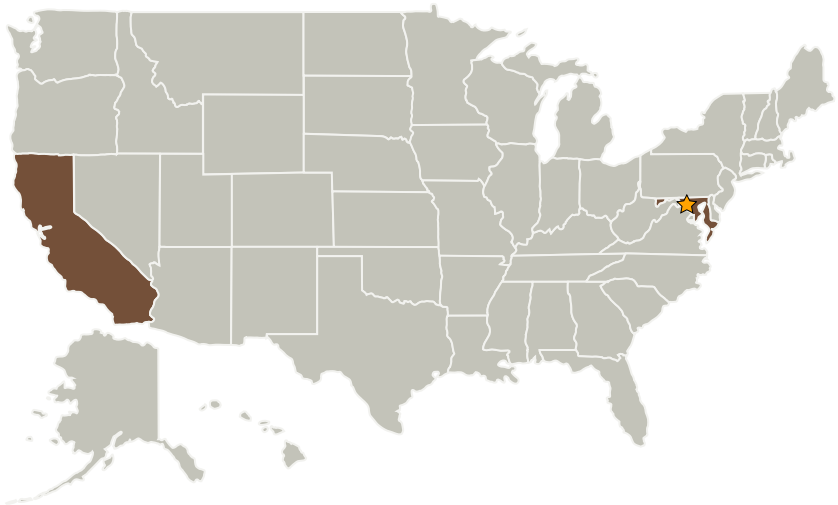
The Atom Interferometry (AI) Technology for Gravity Wave Measurements demonstrates new matter wave Interferometric sensor technology for precise detection and measurement of primordial gravity waves and space geodesy.

Develop an Atom Interferometry-based gravity wave detector (vs Optical Interferometry). Characterize a high power laser. Use Goddard Space Flight Center Mission Design Lab to study a single flyer with boom and developed cost estimate. Also funded a study at Stanford on Large Momentum Beam Splitters applications for Detection of Gravity Waves using Atom Interferometry.

Anticipated Benefits

The Atom Interferometry Technology will enable detection of Gravity Waves using Atom Interferometry sensors. Applicable for a gravity gradient mission, gravity wave missions, and sun normal mode measurements. It allows for extremely hard to do measurements of phase of Gravity Wave for astrophysics and gravity gradient for Geodesy. It greatly reduces mission cost by allowing single, smaller spacecraft for same science.

Primary U.S. Work Locations and Key Partners



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Organizations Performing Work	Role	Type	Location
★Goddard Space Flight Center(GSFC)	Lead Organization	NASA Center	Greenbelt, Maryland

Primary U.S. Work Locations	
California	Maryland

Project Website:

http://aetd.gsfc.nasa.gov/

Organizational Responsibility

Responsible Mission Directorate:

Mission Support Directorate (MSD)

Lead Center / Facility:

Goddard Space Flight Center (GSFC)

Responsible Program:

Center Independent Research & Development: GSFC IRAD

Project Management

Program Manager:

Peter M Hughes

Project Manager:

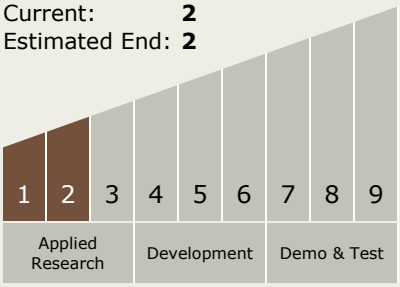
Terry Doiron

Principal Investigator:

Babak N Saif

Technology Maturity (TRL)

Start: **1**
Current: **2**
Estimated End: **2**



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Technology Areas

Primary:

- TX06 Human Health, Life Support, and Habitation Systems
  - TX06.4 Environmental Monitoring, Safety, and Emergency Response
    - TX06.4.2 Fire: Detection, Suppression, and Recovery